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## NOTICE OF ALLOWANCE AND FEE(S) DUE

7590

01/02/2003

Kevin G. Mierzwa  
Artz & Artz PLC  
Suite 250  
28333 Telegraph Road  
Southfield, MI 48034

EXAMINER

MARC COLEMAN, MARTHE Y

ART UNIT

CLASS-SUBCLASS

3661

701-038000

DATE MAILED: 01/02/2003

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/091,264	03/04/2002	Jianbo Lu	200-1749	6453

TITLE OF INVENTION: ATTITUDE SENSING SYSTEM FOR AN AUTOMOTIVE VEHICLE RELATIVE TO THE ROAD

APPLN. TYPE	SMALL ENTITY	ISSUE FEE	PUBLICATION FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1300	\$300	\$1600	04/02/2003

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE REFLECTS A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE APPLIED IN THIS APPLICATION. THE PTOL-85B (OR AN EQUIVALENT) MUST BE RETURNED WITHIN THIS PERIOD EVEN IF NO FEE IS DUE OR THE APPLICATION WILL BE REGARDED AS ABANDONED.

## HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.
- B. If the status is changed, pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above and notify the United States Patent and Trademark Office of the change in status, or

If the SMALL ENTITY is shown as NO:

- A. Pay TOTAL FEE(S) DUE shown above, or
- B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check the box below and enclose the PUBLICATION FEE and 1/2 the ISSUE FEE shown above.
- ☐ Applicant claims SMALL ENTITY status.  
See 37 CFR 1.27.

II. PART B - FEE(S) TRANSMITTAL should be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). Even if the fee(s) have already been paid, Part B - Fee(s) Transmittal should be completed and returned. If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER:** Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.



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MARC COLEMAN, MARTHE Y

ART UNIT

PAPER NUMBER

3661

DATE MAILED: 01/02/2003

**Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)**  
(application filed on or after May 29, 2000)

The patent term adjustment to date is 0 days. If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the term adjustment will be 0 days.

If a continued prosecution application (CPA) was filed in the above-identified application, the filing date that determines patent term adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) system. (<http://pair.uspto.gov>)

Any questions regarding the patent term extension or adjustment determination should be directed to the Office of Patent Legal Administration at (703)305-1383.

# Notice of Allowability

Application No.

10/091,264

Examiner

Marthe Y Marc-Coleman

Applicant(s)

LU ET AL.

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## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 11/25/02.
2. ☒ The allowed claim(s) is/are 1-14.
3. ☒ The drawings filed on 04 March 2002 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- \* Certified copies not received: \_\_\_\_\_.
5. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
  - (a) ☐ The translation of the foreign language provisional application has been received.
6. ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE**

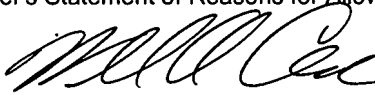
7. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
8. ☐ CORRECTED DRAWINGS must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No. \_\_\_\_\_.
  - (b) ☐ including changes required by the proposed drawing correction filed \_\_\_\_\_, which has been approved by the Examiner.
  - (c) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No. \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the top margin (not the back) of each sheet. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

9. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

- |  |   |
|--|---|
| 1 <input type="checkbox"/> Notice of References Cited (PTO-892)  | 2 <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)          |
| 3 <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                    | 4 <input type="checkbox"/> Interview Summary (PTO-413), Paper No. _____             |
| 5 <input type="checkbox"/> Information Disclosure Statements (PTO-1449), Paper No. _____               | 6 <input checked="" type="checkbox"/> Examiner's Amendment/Comment <b>B</b>         |
| 7 <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit of Biological Material | 8 <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
|  | 9 <input type="checkbox"/> Other  |

  
WILLIAM A. CUCHLINSKI, JR.  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600

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**EXAMINER'S AMENDMENT** *B*

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Mr. Kevin G. Mierzwa (Reg. No. 38,049) on December 30, 2002.

2. The application has been amended as follows:

In regard to claim 14, on page 31, line 9, insert -- a-- after determining; ✓

In regard to claim 14, on page 31, line 9, replace "the" before relative by -- a--; ✓

In regard to claim 14, on page 31, line 10, replace "the" before global roll by -- a--; ✓

In regard to claim 14, on page 31, line 10, insert "a" before global pitch. ✓

3. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marthe Marc-Coleman whose telephone number is (703) 305-4970. The examiner can normally be reached on Monday-Thursday from 9:30AM - 8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William A Cuchlinski can be reached on (703) 308-3873. The fax phone numbers

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for the organization where this application or proceeding is assigned are (703) 305-7687 for regular communications and (703) 305-7687 for After Final communications.


Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

Patent Examiner

*mym*

Marthe Marc-Coleman

December 30, 2002

  
WILLIAM A. CUCHLINSKI, JR.  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600

## REASONS FOR ALLOWANCE

1. The following is an examiner's statement of reasons for allowance:

U.S. Patent No. 6,192,305 discloses rollover sensing apparatus and method are provided for predicting rollover or pitchover conditions of a vehicle. The apparatus and method sense angular roll rate, angular pitch rate, longitudinal acceleration, lateral acceleration, and vertical acceleration of the vehicle and produce output signals indicative thereof. A non-linear filter, such as an extended Kalman filter, estimates a current roll angle and a current pitch angle as a function of the sensed signals. A predictor predicts a future roll angle as a function of the estimated current roll angle and the sensed roll rate, and further predicts a future pitch angle as a function of the estimated current pitch angle and the sensed pitch rate. The predicted roll and pitch attitude angles are compared to a threshold value and a vehicle overturn condition signal is output to indicate a predicted vehicle rollover or pitchover condition. In addition, the measured pitch rate and roll rate signals are corrected to compensate for yaw-induced error that may be present. U.S. Patent No. 6,292,759 discloses an attitude angle estimator and method of estimating attitude angle of a vehicle. According to one embodiment, an angular attitude rate sensor senses angular attitude rate of a vehicle, and an accelerometer detects lateral or longitudinal acceleration. An attitude angle estimate is produced and is updated as a function of the sensed angular attitude rate. An acceleration-based attitude angle is determined as a function of the sensed

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acceleration, and a blending coefficient is provided. A current vehicle attitude angle estimate is generated as a function of the updated attitude angle estimate, the acceleration-based attitude angle, and the blending coefficient.

None of the above-cited references either singularly or in combination teach or fairly disclose:

“a controller coupled to said first angular rate sensor, said second angular rate sensor, said lateral accelerometer, said longitudinal accelerometer and said wheel speed sensor, said controller determining a roll gradient based upon a past raw roll rate and current raw roll rate, the first angular rate signal or the second angular rate signal and the lateral acceleration signal, a pitch gradient based upon a past raw pitch rate and current raw pitch rate, the first or second angular rate signal and the longitudinal acceleration signal, determining a relative roll and relative as a function of the roll gradient and the pitch gradient”.

“a controller coupled to said roll angular rate sensor, said yaw angular rate sensor, said lateral accelerometer, said longitudinal accelerometer and said wheel speed sensor, said controller determining a pitch rate in response to said roll angular rate signal, said yaw motion signal, said lateral acceleration signal, said longitudinal acceleration signal and said wheel speed signal,. Said controller determining a roll gradient based upon a past raw pitch rate and current raw pitch rate, the roll angular rate signal and the lateral acceleration signal; a pitch gradient based upon a past raw pitch and current raw pitch rate, the calculated pitch angular rate signal and the longitudinal acceleration signal,

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determining a relative roll and relative pitch as a function of the roll gradient and the pitch gradient".

"determining relative roll angle, a relative pitch angle, a global roll and global pitch angle in response to the roll rate, the yaw rate, the lateral acceleration and the longitudinal acceleration".

2. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marthe Y Marc-Coleman whose telephone number is (703) 305-4970. The examiner can normally be reached on Monday-Thursday from 9:30 AM - 8:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William A Cuchlinski can be reached on (703) 308-3873. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7687 for regular communications and (703) 305-7687 for After Final communications.



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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1113.

Patent Examiner

*MYM*

Marthe Marc-Coleman

December 30, 2002

  
WILLIAM A. CUCHLINSKI, JR.  
SUPERVISORY PATENT EXAMINER  
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